



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/816,892	04/05/2004	Tadayuki Hatsuda	NS-US045036	4032
22919	7590	08/08/2006	EXAMINER	
GLOBAL IP COUNSELORS, LLP 1233 20TH STREET, NW, SUITE 700 WASHINGTON, DC 20036-2680			BOTTORFF, CHRISTOPHER	
			ART UNIT	PAPER NUMBER
			3618	

DATE MAILED: 08/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/816,892	HATSUDA ET AL.	
	Examiner	Art Unit	
	Christopher Bottorff	3618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2,4,6,8-10,12-17 and 19 is/are pending in the application.
- 4a) Of the above claim(s) 4,6 and 9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2,8,10,14-17 and 19 is/are rejected.
- 7) ☒ Claim(s) 12 and 13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

The amendment filed May 23, 2006 has been entered. Claims 1, 3, 5, 7, 11, 18, and 20 are canceled. Claims 2, 4, 6, 8-10, 12-17, and 19 are pending. Claims 4, 6, and 9 are withdrawn as being directed toward nonelected species.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 15 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Dependent claim 15 recites the limitation "control unit" in line 4 while independent claim 10 recites the limitation "controller" in line 13. This suggests that the control unit and controller are two separate control systems. However, the disclosure only indicates one control system. For the purposes of examination, the "control unit" of claim 15 has been interpreted as referring to the "controller" of claim 10 such that the controller must be configured as required by claim 15.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

Art Unit: 3618

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8, 10, 14, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmitz et al. US 6,622,804 in view of Brandon et al. US 6,717,281 and Shimasaki et al. US 6,019,183.

Schmitz et al. disclose a drive apparatus comprising a first drive unit and a second drive unit. See Figure 1. The first drive unit includes a first electric motor 50 configured and arranged to drive a first wheel 13. The first drive unit further includes a first reduction gear 52 operatively coupled to the first electric motor 50 to reduce speed of the first electric motor 50. See Figures 1 and 3. The second drive unit includes a second electric motor 60 configured and arranged to drive a second wheel 14 disposed on an opposite side of the vehicle from the first wheel 13. The second drive unit further includes a second reduction gear 62 operatively coupled to the second electric motor 60 to reduce speed of the second electric motor 60. See Figures 1 and 3.

First and second inverters 54, 64 are configured and arranged to supply electrical power separately to the first and second electric motors 50, 60, respectively. See Figure 3. Also, a driven wheel drive controller 200 is configured to control the first and second inverters 54, 64 to separately control a torque of each of the first and second electric motors 50, 60. See column 5, lines 12-54.

Schmitz et al. do not utilize non-permanent magnet, switched reluctance, electric motors. Schmitz et al. also do not disclose that the controller includes a function for stopping the flow of current to the motors when the vehicle regenerative speed is equal

Art Unit: 3618

to or greater than a prescribed vehicle speed or to allow the flow of current when the vehicle speed is equal to or greater than a prescribed vehicle speed.

However, Brandon et al. teach the desirability of utilizing non-permanent magnet, switched reluctance, electric motors in a drive apparatus. See column 5, lines 42-61. From the teachings of Brandon et al., utilizing non-permanent magnet, switched reluctance, electric motors as the first and second electric motors of Schmitz et al. would have been obvious to one of ordinary skill in the art at the time the invention was made. This would decrease the size and cost of the motors.

Furthermore, Shimasaki et al. teach the desirability of configuring a controller to control inverters to stop the flow of current to motors when the vehicle speed is equal to or greater than a prescribed vehicle speed and to allow the flow of regenerative current when the vehicle speed is equal to or greater than a prescribed vehicle speed. See column 14, lines 6-9, 13-16, and 21-33; column 12, lines 31-33; and column 9, lines 18-23. From the teachings of Shimasaki et al., configuring the control of Schmitz et al. to control the first and second inverters to stop the flow of current to the motors when the vehicle speed is equal to or greater than a prescribed vehicle speed and to allow the flow of regenerative current when the vehicle speed is equal to or greater than a prescribed vehicle speed would have been obvious to one of ordinary skill in the art at the time the invention was made. This would ensure that the high power demands of high speed operation are satisfied by the engine and not the motor and would efficiently utilize vehicle energy and charge the battery.

Art Unit: 3618

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schmitz et al. US 6,622,804 in view of Brandon et al. US 6,717,281 and Shimasaki et al. US 6,019,183 as applied to claim 10 above, and further in view of Kawamoto et al. US 5,382,854.

Schmitz et al. do not disclose that the drive units are each housed substantially within the rim of the corresponding wheel. However, Kawamoto et al. teach the desirability of housing a drive unit 24, 31 substantially within a wheel rim 45. See Figure 1. From the teachings of Kawamoto et al., housing each drive unit of Schmitz et al. in the rim of the corresponding wheel would have been obvious to one of ordinary skill in the art at the time the invention was made. This would provide a more compact arrangement that efficiently utilizes space within the apparatus.

Claims 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmitz et al. US 6,622,804 in view of Brandon et al. US 6,717,281 and Shimasaki et al. US 6,019,183 as applied to claim 10 above, and further in view of Ohba et al. US 6,449,552.

Schmitz et al. disclose third 11 and fourth 12 wheels, an internal combustion engine power source 300, and a generator 310 mechanically coupled to the internal combustion engine and electrically coupled to the first and second electric motors 50, 60. See Figure 1. Schmitz et al. also disclose that the third and fourth wheels may be driven. See column 1, lines 32-33. Schmitz et al. do not disclose how the third and fourth wheels may be driven and that the control unit is configured to selectively switch

Art Unit: 3618

between a four wheel drive mode and a two wheel drive mode. However, Ohba et al. teach the desirability of configuring and arranging an internal combustion engine 14 to drive third 66 and fourth 68 wheels and configuring a control unit 100, 102, 104, 106, 108 to selectively switch between a four wheel drive mode and a two wheel drive mode. See Figure 2; column 5, lines 22-31; and column 7, line 58, through column 8, line 6. From the teachings of Ohba et al., configuring and arranging the internal combustion engine of Schmitz et al. to drive the third and fourth wheels and configuring the control unit of Schmitz et al. to selectively switch between a four wheel drive mode and a two wheel drive mode would have been obvious to one of ordinary skill in the art at the time the invention was made. This would allow for improved control of the vehicle by allowing power to be distribution between the wheels numerous ways.

Allowable Subject Matter

Claims 12 and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art does not teach or suggest the specific ball bearings required by claim 12 in combination with non-permanent magnetic electric motors and the further limitations of claim 10.

Response to Arguments

Applicant's arguments with respect to the office action mailed March 8, 2006 have been considered but are moot in view of the new grounds of rejection.

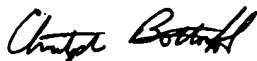
Conclusion

This office action is NOT final since the terms of rejection for claim 10 were not necessitated by amendment or previously presented.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher Bottorff whose telephone number is (571) 272-6692. The examiner can normally be reached on Mon.-Fri. 7:30 a.m. - 4:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Ellis can be reached on (571) 272-6914. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Christopher Bottorff